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THE PETROLEUM OF CHINA

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FOREWORD

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THE PETROLEUM OF CHINA

Following is the translation of an article by I. R. Kalinov in Azerbaydzhanskoye Neftyanoye Khozyaystvo (Azerbaydzhani Petroleum Industry), Baku, No 1, 1961, pages 47-48.

China has a long history of using petroleum and natural gas, which originated more than 1800 years ago. As early as 221 BC, upon boring a well through salt water in the province of Szechwan, petroleum and gas were struck. In the VI-IXth centuries, manuscripts of the Tang Dynasty state that when the nomad tribes of Kidan, laying siege to Chü-chüan, attempted to take the city walls by storm, the defenders of the city poured "boiling oil" on them... For many centuries the Chinese people could not make use of the treasures in the bowels of the earth. This was primarily impeded by the technical-economical backwardness of the country and the reign of reactionaries and foreign colonialists, who did everything in their power to spread the story that China was poor in petroleum. American entrepreneurs were particularly active in this respect. The creation of modern enterprises of the petroleum industry in China began only in 1907, when in Yenchan, in the North of Shensi Province, China's first oil well was drilled. But from that time on oil prospecting and extraction stood still for decades. During a period of 42 years in the Old China, only 71,000 meters were drilled (123 prospecting and 45 production wells). The maximum annual petroleum production before the liberation of the country was achieved in 1943. It did not exceed 320,000 tons. In 1948 petroleum production totalled 90,000 tons.

Foreign, primarily American, monopolies consciously slowed down the development of a Chinese domestic petroleum industry. China was necessary to them primarily as a market for American petroleum products. It is no mere chance that the Rockefeller Trust once sent millions of kerosene lamps as "gifts" to the Chinese peasants. The American businessmen were aware of the fact that each owner of a lamp would have to purchase kerosene, and this naturally would be American kerosene. China many times invited experts from the United States to organize geological petroleum surveys. But

the efforts of the American "specialists" were more often than not directed not on finding petroleum, but on proving its non-existence in China. They did everything in their power in order to hinder the Chinese people from creating their own national petroleum industry. This was advantageous to the colonialists, who were endeavoring to maintain China in constant dependence and to receive colossal profits. By 1946 the Americans had imported into China 90% of all petroleum products used there. After the formation of the Chinese People's Republic, great vistas of opportunity opened before the petroleum industry as before other branches of the economy. Geological surveys were conducted on a large scale. Prior to the liberation of China, there was no more or less permanent geological survey team engaged in petroleum prospecting. In all of China there were only 24 geologists with higher or secondary specialized education who were conducting prospecting for petroleum. Since 1950, when the exploration of petroleum resources began on a large scale, signs of petroleum and gas were discovered in many provinces of China. In 26 of 129 oil-bearing structures explored up to 1959, large enough reserves of petroleum were found to have industrial significance. Fifteen of these structures were found during the Great Leap Forward, which took place in the national economy in 1958. In 1956 the fields of Yuimen alone produced as much petroleum as had been produced during their entire ten years of existence under the Kuomintang. There was great development in the petroleum industry of China during the first Five Year Plan. In 1957 the extraction of petroleum in the country increased 300% in comparison with 1952, and reserves explored during this period increased by almost 400%. The number of processed types of petroleum products increased 700 to 800% during this time. American specialists working in the province of Szechwan before the liberation of China estimated that there was no future for petroleum in this area. Geological work conducted here with the participation of Soviet specialists made it possible to discover in the Szechwan Depression China's largest oil region. It is believed that the Szechwan Depression may become one of the world's largest oil regions. According to preliminary data, the total area of the oil fields comprises tens of thousands of square kilometers. This oil region is located on the shores of the Yangtze and Chialing rivers, not far from the recently-built Paotsi-Chengtzu-Chungking Railroad.

An important achievement was the discovery in the Tsaidam Depression of petroleum and gas deposits. Until recent times the Tsaidam Depression was a rugged and uninhabited region. Geological prospecting teams conducted vast exploration projects there under exceedingly difficult condi-

tions. At present the Tsaidam Depression, located in Western China, can rightly be called "the treasure house of countless riches". Here there are already more than 200 gushing wells, and some oil-bearing strata are situated quite close to the surface -- at a depth of 240-250 meters. The province of Tsinghai on the territory of which the Tsaidam Depression is located, is one of 20 provinces and autonomous regions of China where during the past years deposits of petroleum and gas have been found, as well as deposits of ferrous and non-ferrous metals and other valuable industrial mineral wealth. The Tsaidam Depression, which was an uninhabited wilderness for thousands of years, has now become an important industrial raw material base in China's Northwest. The first drilling occurred in this uninhabited area of the Gobi Desert in 1954. In the Lenghu oil field alone about 100 wells have been drilled since June 1959. At the present time oil is being pumped in the Hoyen Shan Mountains. These mountains are situated in the center of the Turufan Depression, in the Sinkiang-Uigur Autonomous Region. These oil deposits were discovered in recent years. It is believed that the total area of these deposits exceeds 230 sq km. The petroleum extracted from these deposits is noted for its high quality. In the Northern part of the Sinkiang-Uigur Autonomous Region a new Chinese petroleum center is being built rapidly -- the city of Karamai. In October 1955 the first oil well was drilled here, and at present dozens of powerful wells are already pumping oil. Oil exploration is penetrating deeper and deeper into the remote regions of Southwest and Western China. On the basis of deposits already discovered, construction is going on of new petroleum enterprises, settlements and large cities of the petroleum industry. At present China possesses four large petroleum regions: the Chüchüan region in Kansu Province, the Dzhungaria region in the Sinkiang-Uigur Autonomous Region, the Tsaidam region in Tsinghai Province and the Ssuchuran region. Oil prospecting is being conducted on a large scale, and oil is being extracted. Yuimen in the region of Chüchüan, Karamai in Dzhungaria, Lenghu in Tsaidam and the Southern part of Szechwan Province are the basic centers of petroleum and natural gas extraction.

In 21 provinces and autonomous regions up to 200 deposits of oil-bearing shale have been discovered -- this valuable mineral with a high percentage of petroleum content. In the Chengte district, located in the North of Hopeh province, eight large mountains have been discovered which consist almost 100% of oil-bearing shales. It is believed that the reserves of oil-bearing shales are extremely large. Even more common in China are coal deposits which are suitable for refining into petroleum. Of somewhat more than 2000 hsien

in the country, coal deposits have been found in 1600. Thanks to the continuous growth in the technical level of exploration work, the scale of geological petroleum prospecting is expanding constantly, and the rate of conducting prospecting is increasing. At present there are more than 900 geological exploration parties in China, which are prospecting in 34 regions in the country, 94 of these being geophysical parties. Oil prospectors are using more than 480 modern drilling rigs. Since 1949 oil exploration parties have drilled about 4,000,000 meters of shafts. This is more than 50 times greater than during the period of 42 years in Old China. During the last 11 years alone more than 3000 exploratory shafts were drilled -- 24 times greater than in Old China, and about 2000 producing wells, which is 42 times greater than during the 42 years before the liberation of the country. The broad scale of geological exploration has made it possible to reveal a large number of oil-bearing structures and oil deposits in the regions of Tarim and the Turfan Depression, as well as in the Ningsia Hui Autonomous Region, in the Kwanghsi-Chwan Autonomous Region, in the province of Liaoning, Kirin, Kweichow and elsewhere. Signs of petroleum and gas have been discovered also in Eastern and Northern China, in the provinces of Hunan, Hupeh, Fukien, Kwangtung, in the Inner Mongolian Autonomous Region and in Tibet. Along with the speedup in construction and prospecting in the regions of the Karamai (Sinkiang), Tsaidam (Tsinghai) and Szechwan petroleum deposits, more than 500 medium and small synthetic petroleum plants have been built in various regions of the country. The network of these plants embraces the entire country, and their total production capacity exceeds 1.2 million tons per year.

For the purpose of mass construction of medium and small enterprises producing synthetic petroleum, the Peking Planning Institute of the Ministry of the Petroleum Industry has developed for various regions on the country six standard plans for small enterprises producing synthetic petroleum. All of them call for the use of oil-bearing shales or coal as raw material, resources in which China is rich, and they also take into full consideration complete resource use. Reconstructed and newly built plants have become the backbone of China's petroleum industry. They have played a great part in the construction growth of petroleum and petroleum product production. In 1958 2,260,000 tons of crude oil were produced (including 20,000 tons produced by small local enterprises). This is 26.3 times greater than in 1948 and 7.1 times greater than in 1943, when the highest level of petroleum extraction prior to the liberation of the country was achieved. In comparison with 1957, oil production in 1958 increased 55%. The extraction of natural petroleum

increased particularly rapidly. Its percentage in the total for crude oil in 1952 amounted to 45%, while in 1958 it increased to 65%. In 1959 3.7 million tons of petroleum were produced in China. The variety of petroleum products produced in China also increased to a great degree. Before liberation, the country produced only 17 types of petroleum products, while now there are more than 90 types. At present China can produce large quantities of many high quality petroleum products. Projects on the experimental production of new products is continuing on a large scale. Simultaneously with the development of basic production enterprises, scientific research and planning-prospecting organizations and petroleum industry institutions have been formed. Scientific research institutes, laboratories and planning organizations have been formed at almost all bases of the petroleum industry and at large enterprises producing synthetic petroleum. The Petroleum Institute of the Chinese Academy of Sciences, situated in the city of Luita, has become the country's most important base for scientific research connected with the development of the petroleum industry. With the establishment of the people's rule, the government has been sending scientists here for research projects. This scientific institution has radically changed and has become a new scientific base placed in the service of the country's socialist construction. Scientific research in the field of petroleum, which was at an extremely low level in Old China, has been developed greatly. The Institute constantly stresses the combination of scientific activity with production, with the training of cadres. Large shops with instruments and equipment have been built here, basically satisfying the needs of scientific research. The graduate division organized at the Institute trains cadres of scientific workers for it. The number of topics developed by the petroleum Institute has increased more than ten-fold. As early as the first years of its existence, this scientific institution developed a method of assaying petroleum, aided the petroleum industry in creating standardized analytical instruments and a unified method of analysis. These methods were used for analyzing and appraising the most important deposits of natural petroleum and oil-bearing shales, played an important part in the expansion of existing and construction of new enterprises of the petroleum industry. The Petroleum Institute aided the Anshan Metallurgical Combine in solving the problem of expanding toluol production. It also aided many industrial enterprises in planning coal gasification stations. The Institute has carried out important research connected with the development of new techniques of refining petroleum and has proposed efficient variants for refining it. The Petroleum Institute achieved fine

results in the extraction of synthetic liquid fuel from waste materials from the chemical industry. The young scientific workers of China have created the first experimental plant for synthetic liquid fuel. Experimental plant operations have already produced fine results. Chinese petroleum workers are persistently mastering the latest technology and new examples in carrying out complex and regional geological oil exploration. Geographical exploration is in wide use. Radioactive well logging has also received wide scale use. There has been great improvement in the technique of well drilling. Now drilling is conducted throughout the year. The technique of deep, inclined and double barrelled drilling has been incorporated. Chinese petroleum workers are making broad use of the method of supporting pressure by forcing water and air into the stratum. This has made it possible to increase to a great degree the oil well use coefficient, which has great significance for the efficient use of resources and increase in petroleum production. At the same time great progress has been achieved in the field of technology and petroleum refining, and oil yield from shales has increased considerably.

Along with the growth of the rapidly developing national economy, the domestic demand for petroleum and petroleum products has increased tremendously also. The Party and Government are devoting unstinting attention to the development of the petroleum industry. In accordance with the proposals of the Eighth Congress of the Communist Party of China, in 1962 the extraction of petroleum in this country should increase to 400% that of 1952 and total 5 to 6 million tons per year. With this aim, geological exploration and development of natural petroleum are being expanded, and the production of synthetic petroleum from oil-bearing shales and bituminous coal is being increased. Large funds are being channelled to the petroleum industry and the most modern labor methods and new equipment are being incorporated. Even now, according to figures by competent organs, it is believed that the plan for extraction and processing of petroleum for the Second Five Year Plan will be greatly over-fulfilled. The Soviet Union and other countries in the Socialist camp are lending the Chinese people brotherly aid in developing China's domestic petroleum industry. During the past 11 years the Soviet Union, making use of various forms of aid, has sent to China as many as 500 specialists who have lent and are lending comprehensive aid in the exploration of petroleum resources, the exploitation of oil deposits, the construction of oil refineries and the training of cadres. The Soviet Union has furnished China with machinery and equipment, has furnished technical documentation, has aided in incorporating the production of new types

of products, as well as solving the problem of the storage and transportation of petroleum. The Chinese petroleum workers have established a close, brotherly friendship with the Soviet specialists. It is this that has made it possible to shorten the term necessary for creating a modern petroleum industry in China, to lay the foundation for a further and even broader development of this extremely important branch of industry.